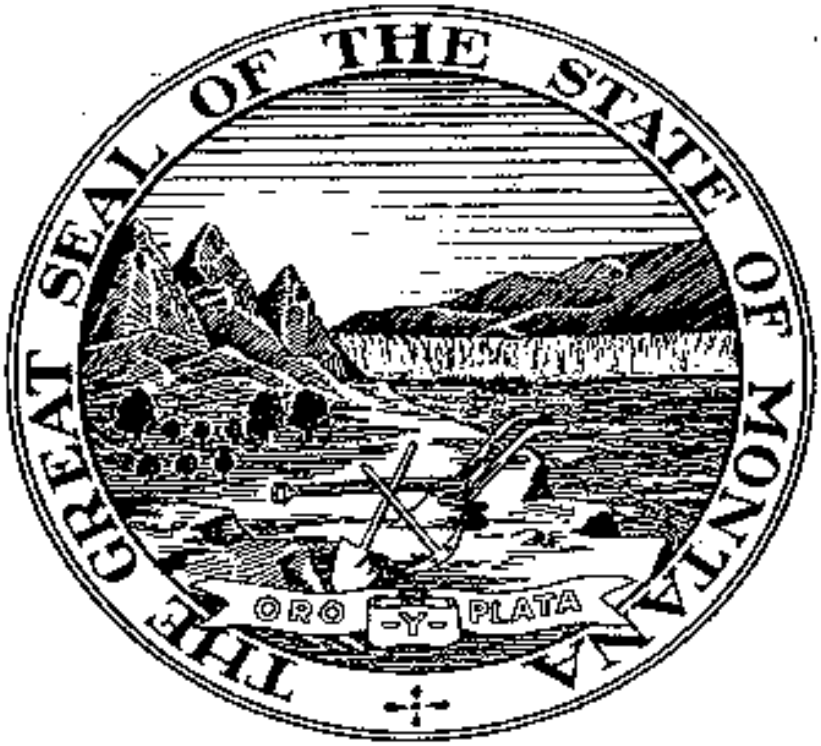
Tuberculosis Outreach Training Materials

Occupational Safety and Health Bureau



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TUBERCULOSIS: OCCURRENCE

Since the mid 1980's, there has been a substantial increase in the number of reported cases of tuberculosis (TB) in the United States. Since 1985, the incidence of TB in the general population has increased 20 percent, reversing a 30 year downward trend. In 1992, there were 26,673 new cases of TB reported in the U.S. Recently, drug resistant strains of TB have become a serious concern and cases of multi-drug resistant tuberculosis (MDR-TB) have been reported in forty states. Worldwide, about 8 million cases and 3 million deaths occur annually from TB.

No single factor has brought about this increase of TB. Rather, it has multiple causes, including overcrowding in homeless shelters and correctional facilities, human immunodeficiency virus (HIV), immigration from countries with a high prevalence of TB, and reduced resource available for TB control.

TUBERCULOSIS: THE DISEASE

TB is an infectious disease caused by the bacterium, *Mycobacterium tuberculosis*. It is spread-primarily by airborne droplets ("droplet nuclei") generated when a person with TB disease coughs, sneezes, or speaks. When inhaled by susceptible persons, the bacteria in these droplets may, become established in the lungs, and in some cases, spread throughout the body. After an interval of months, years, or even decades, the initial infection may then progress to TB disease. Approximately 90% of all people infected with TB will never develop active TB.

TUBERCULOSIS: SYMPTOMS

The general symptoms of TB may include fatigue, fever, lethargy, weakness, night sweats, weight loss, and a persistent productive cough. TB symptoms can occur two to three months after infection or years later.

TB can attack any part of the body. If TB occurs in the lungs (the most common site), it is called pulmonary TB disease. The symptoms. may include cough, cough with blood, or chest pain. TB can also occur at other sites of the body including the spine, kidneys, or lymph system. The signs and symptoms will vary depending on the location of the disease. TB occurring at body sites other than the lungs is called extrapulmonary TB.

TUBERCULOSIS: DETECTION

The tuberculosis skin test is used to detect TB infection. There are several kinds of tuberculin skin tests but the most reliable is called the Mantoux PPD (purified protein derivative) test. It is performed by injecting 0.1 milliliters of PPD (5 tuberculin units) just under the skin with a disposable tuberculin syringe. After a 48 to 72 hour time period, a 10 millimeter or greater area of the skin is examined for a reaction (or swelling) at the site of the injection.

A positive result measured by induration of the skin indicates TB infection but does not-

necessarily indicates TB disease. Millions of people are infected with TB. For most of these people, the TB bacterium will always remain inactive. However, for some people (approximately 10% of the population, the bacterium may become active later, possibly many years later). When the TB test result is positive, further medical evaluation such as chest X-rays, sputum smears, and cultures are necessary.

A negative result indicates that there probably is no infection by the tubercle bacilli. However, the absence of a reaction to the tuberculin skin test does not exclude the diagnosis of TB or TB infection. Because the response to PPD is generated by the immune system, if the immune system is suppressed (HIV infection, cancer, or diabetes, etc.) a response may not be produced. In addition, persons who have been recently infected may not yet have a reaction to the skin test.

TUBERCULOSIS: TREATMENT

The are four drugs that are commonly used to treat tuberculosis. These drugs are:

Isoniazid
Rifampin
Pyrazinamide
Ethambutol

Tuberculosis disease should always be treated with at least two of these drugs. The preferred treatment regimen is of 6 months duration and includes 2 months of daily isoniazid, rifampin, and pyrazinatnide, followed by 4 months of daily or twice - weekly isoniazid and rifampin. The 9 month treatment regimen is also acceptable and includes 1 or 2 months of daily isoniazid and rifampin, followed by daily or twice-weekly isoniazid and rifampin, for a total duration of 9 months. Both- of these regimes should be supplemented with either ethambutol **or** streptomycin when isoniazid resistance is suspected or if extensive or life-threatening disease is present. After the initial phase of daily therapy, intermittent therapy (twice weekly) is an eff6ctive alternative to daily therapy.

Tuberculosis must be treated for a long time (6-9 months) or longer in the case of MDR-TB as compared to many other infectious diseases. Noncompliance with therapy is a major problem in tuberculosis control. Regimes for TB treatment must contain multiple drugs to which the organisms are susceptible. Administration of a single drug can lead to the development of a bacterial population that is more resistant to that drug. When two or more drugs are used simultaneously, each helps prevent the emergence of tubercle bacilli resistant to others.

TUBERCULOSIS: OSHA ENFORCENIENT ACTIVITIES

In response to employee complaints about occupational exposure to TB, OSHA has conducted inspections and issued citations where appropriate. In May 1992, OSHA Region II in conjunction with the New York State Public Employee Safety and Health Program and OSHA's

National Office, developed and issued "Enforcement Guidelines for Occupational Exposure to Tuberculosis." These guidelines were issued as a result of the increasing number of complaints received in the local Area Offices from health-care workers occupationally exposed to TB. The primary purpose of the guidelines was to provide compliance officers with guidance on how to protect themselves during TB-related inspections and outline the Region's enforcement requirements. The guidelines were based on the Centers for Disease Control and Prevention (CDC) 1990 "Guidelines for Preventing the Transmission of Tuberculosis in Health Care Settings with Special Focus on HIV-Related Issues." This document outlined general principles of TB control and CDC's specific recommendations including the hierarchy of controls to be implemented.

Nationwide, OSHA has conducted approximately 30 TB inspections most in the New York area. These inspections have revealed that employers are not fully implementing the CDC guidelines.

On October 8, 1993, OSHA issued agency-wide enforcement guidelines on TB.
These guidelines are based on CDC 1990 guidelines (currently being revised).
OSHA is relying on these guidelines as reflecting a widely recognized and accepted standard of protection to be followed by employer in carrying out their responsibilities under the OSH Act.
The following provides a summary of the OSHA enforcement guidelines.

INSPECTIONS

Inspections for occupational exposure to TB are only conducted in response to employee complaints or as part of all industrial hygiene compliance inspections conducted in workplaces where CDC has identified workers as having a greater incidence of TB infections. These workplaces are:

- health care settings
- correctional institutions
- homeless shelters
- long-term care facilities for the elderly
- drug treatment centers.

A TB-related inspection is any health inspection conducted for the purpose of investigating the presence or alleged presence of TB disease or any health inspection which results in a TB-related citation. .

COMPLIANCE OFFICER PROTECTION

Compliance officers who respond to TB-related complaints must take the following additional precautions when conducting a TB-related inspection which include:

- Compliance Officers - shall not enter occupied isolation rooms to evaluate compliance.

- Compliance Officers shall not enter work areas while high hazard procedures such as aerolized administration of medication, bronchoscopy, and diagnostic sputum induction are being conducted

- When entry into a high hazard area is deemed necessary, compliance officers shall use as a minimum a NIOSH approved respirator with HEPA filters. This decision will be based on professional judgement after consultation with the OSHA supervisor..

CITATION GUIDANCE

Since occupational exposure to TB is a serious and recognized hazard and certain feasible abatement methods exist, the application of Section 5(a)(1) of the OSH Act is warranted.

Citations are issued only to employers whose employees work in one of the five types of facilities whose workers have been identified by the CDC as having a higher incidence of TB that the general population and whose employees have exposure defined as follows:

- Potential exposure to exhaled air of an individual with suspected or confirmed TB disease.

- Exposure to a high hazard procedure performed on an individual with suspected or confirmed TB disease which has the potential to generate potentially airborne respiratory secretions.

The hazard, not the absence of a particular means of abatement is the basis for the general duty clause citation. Examples of feasible and useful abatement methods include:

- Protocol for the early identification of individuals with activetuberculosis;

- Medical surveillance (at no cost to employees) including preplacement evaluation, administration and interpretation of the TB Mantoux skin tests, and periodic evaluations must be offered to employees as follows: initial baseline screening at the time of employment for all employers in the covered facilities; and retesting every six months- for exposed workers;

- Evaluation and management (at no cost to employees) of workers with a positive skin test, or with skin test conversion on repeat testing or who are exhibiting symptoms of TB including work restrictions for infectious employees;

- Placement of individuals with suspected or confirmed TB disease in AFB (acid fast-bacidi) isolation room. AFB isolation rooms must be maintained under negative pressure and appropriately exhausted; and

- Training and information to ensure employee knowledge of issues such as the hazard of TB

transmission, its signs and symptoms, medical ' surveillance, therapy, and site-specific protocols.

RESPIRATORY PROTECTION

CDC's 1990 guidelines recommend that employees wear particulate respirators in the following circumstances:

- When employees enter rooms housing individuals with suspected or confirmed infectious TB disease.

- When employees perform high hazard procedures (i.e., bronchoscopy,sputum induction, etc.) on individuals who have suspected or confirmed TB disease; and

- When emergency-medical-response personnel or others must transport, in closed vehicles, individuals with suspected or confirmed TB disease.

In these circumstances, employers must provide and ensure the use of NIOSH approved high-efficiency particulate-air (HEPA) particulate respirators as the minimum acceptable level of respiratory protection.

OSHA has identified the appropriate minimum level of respiratory protection for occupational exposure to TB, based on the best available information regarding the characteristics of exposure, and the feasibility of compliance as follows:

- The minimum respiratory protection is a NIOSH-approved HEPA particulate respirator.

- The employer must establish and implement a respiratory protection program in accordance with the requirements of OSHA’s Respiratory Protection Standard, 29 CFR 1910.134 (b).

In making the selection for protection against TB, it was necessary to consider factors which affect the performance of respirators such as filter performance, face seal leakage, and fit check. These factors are:

- Identification and selection rationale of the appropriate minimum level of respiratory protection for occupational exposure to TB;

- The filtration characteristics and filtration efficiencies of the different types of particulate respirators, e.g. dust/mist, dust/fume/mist, and HEPA; and

- The NIOSH evaluation methods for the different types of particulate respirators.

OTHER APPLICABLE STANDARDS

Other standards that are applicable to TB inspections include:

29 CFR 1910.145 – Accident Prevention Signs and Tags –which requires that warning signs must be posted outside AFB isolation rooms with the description of the necessary precautions required.

29 CFR 1910.20 – Access to Employee Exposure and Medical Records – which requires that records concerning exposure to TB including skin testing and medical evaluation are on employee exposure records within the meaning of 29 CFR 1910.20.

29 CFR 1904 – Log and Summary of Occupational Injuries and Illnesses – which requires TB infections (positive TB Mantoux skin test) and TB disease to be recorded on the OSHA 200 log in the high risk workplace.